

**AMERICAN FOREST & PAPER ASSOCIATION**

GROWING WITH AMERICA SINCE 1861

**Testimony of  
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**Before the  
U.S. House of Representatives  
Committee on Agriculture  
Review of Agriculture's Role in a Renewable Fuels Standard  
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The American Forest & Paper Association (AF&PA) welcomes this opportunity to present its views, and potential for fulfilling, the 8 billion gallon renewable fuel standard, as proposed in H.R. 3081. The forest products industry can be an important resource in accomplishing the legislation's biofuel goals. The proposed mandates will provide an important incentive to drive private/public investments in Integrated Forest Products Biorefineries (IFPBs), which have the potential to annually produce nearly 2 billion gallons of ethanol and another 1.09 million barrels (oil equivalent) of other renewable transportation fuels. This will facilitate growth of domestic production capacity for renewable fuels using the industry's existing infrastructure. In addition to re-invigorating a critical sector of the US economy, IFPBs could revitalize the primarily rural communities where our industry is based. Finally, introduction of IFPBs will advance national goals for energy, environmental performance, and economic competitiveness of US industries.

The Forest Products Industry

AF&PA is the national trade association of the forest and paper industry and represents more than 200 member companies and related associations that engage in or represent the manufacturers of pulp, paper, paperboard, and wood products. The forest products industry is proud to be one of the nation's primary materials manufacturers, making products that literally touch every facet of our society. Our industry accounts for approximately 7 percent of total U.S. manufacturing output, employs 1.3 million people, and ranks among the top 10 manufacturing employers in 42 states with an estimated payroll of \$50 billion.

As is the case with many U.S. manufacturing industries, we face serious domestic and international challenges. Since 1997, 101 pulp and paper mills have closed in the U.S., resulting in a loss of 70,000 jobs, or 32% of our workforce. An additional 67,000 jobs have been lost in the wood products industry since 1997. New capacity growth is now taking place in other countries, where forestry, labor, and environmental practices may not be as responsible as those in the U.S. In addition, globalization, aging process infrastructure, few technology breakthroughs, as well as recent financial performance and environmental concerns, hinder the ability of U.S. companies to make new investments. Each year without new investments, new technologies and new revenue streams, we lose ground to our overseas competitors.

## Agenda 2020: Creating Value Through Innovation

One approach being taken by our industry to address these challenges is represented by Agenda 2020, our industry's technology alliance. Agenda 2020 was initiated in 1994 in partnership with the Department of Energy to improve energy efficiency and accelerate the delivery of new technologies to our manufacturing processes. Now organized as a membership alliance within AF&PA, Agenda 2020 is building on a decade of tangible results to expand its federal and state partnerships, and establish new international and cross-industry collaborations. Current federal partnerships, in addition to the existing efforts with the Department of Energy, include projects with the U.S. Forest Service and the CSREES (Cooperative State Research, Education and Extension Service) programs of the U.S. Department of Agriculture (USDA), as well as the National Science Foundation.

Agenda 2020's technology initiatives leverage these collaborative partnerships to drive innovation in the forest products industry's processes, materials, and markets. Technology objectives are defined to address shared industry and national strategic goals. The research, development and deployment (RD&D) projects coordinated through Agenda 2020 provide the foundation for new technology-driven business models. **The objective is to create options to meet industry's competitive challenges, while contributing solutions to strategic national needs associated with energy, the environment, and the economy.**

Agenda 2020 builds on our industry's strategic advantage as stewards of abundant, renewable and sustainable forest materials. Since we are also owners of the fundamental infrastructure for its conversion, our industry has the potential to produce new renewable bio-based products – fiber, fuels, chemicals, and power – with “smart” properties and high performance characteristics. Agenda 2020 initiatives are designed to use emerging technologies, such as biotechnology and nanotechnology, coupled with breakthrough advances in process and conversion technologies, to create and capture value from both new and traditional products.

## Integrated Forest Products Biorefineries (IFPBs)

Through Agenda 2020's *Advancing the Forest Biorefinery* initiative, the forest products industry can evolve existing infrastructure to develop *Integrated Forest Products Biorefineries (IFPB)* — geographically distributed facilities that process both forest and agricultural materials to produce renewable "green" bio-energy and bio-products. This can be done while preserving existing traditional product lines, creating higher skilled and better paying jobs, strengthening rural communities, and opening new domestic and international markets for forest products companies. These IFPBs would contribute to reducing greenhouse gas emissions and dependence on foreign fossil fuel by substituting domestic, renewable ligno-cellulosic materials as the feedstock for products now derived from nonrenewable carbon. If fully developed and commercialized, these technologies could produce enormous energy and environmental benefits for the industry and the nation both, including contributing to a diversified, more secure national energy supply. **Early estimates show an industry-wide potential to reduce fossil energy consumption by over 250 TBTUs/yr, with an additional benefit of cutting approximately 40 million tons of carbon emissions annually.**

The general IFPB concept features both cultivation and conversion of ligno-cellulosic materials to produce bio-energy and bioproducts in conjunction with manufacturing traditional forest products. High-quality feedstocks can be cultivated in specially engineered softwood and hardwood plantations. Once the trees have been harvested, IFPBs present opportunities to make bio-based fuels or chemicals at several points in the manufacturing process. Hemicelluloses can be extracted from residuals from wood manufacturing or from wood chips destined for pulping. The hemicelluloses are then converted to ethanol or chemical intermediates. After the wood has been pulped, the residual pulping liquors can be gasified. The resulting synthetic gas can be converted to electric power, transportation fuels (including ethanol), hydrogen, and/or to high value chemicals.

Agenda 2020 is focusing on three component areas to develop and implement the enabling technologies for the IFPB:

- ***Value Prior to Pulping*** seeks cost-effective, high-yield processes to separate and extract selected components from wood prior to pulping, and to process the extracted components to produce commercially viable chemical and liquid fuel products. Researchers are particularly interested in extracting hemicelluloses for conversion to ethanol or a biochemical feedstock. **Commercial-scale demonstrations of these technologies are possible in 3 years. Assuming adoption by 75% of existing Kraft pulp mills, potential annual production of ethanol would be in the range of 1.9 to 2.4 billion gallons.**
- ***New Value Streams from Residuals and Spent Pulping Liquors*** addresses the opportunity to manufacture bio-products from the co-products of the pulping process. The objective is to use gasification technologies to convert biomass, including forest residues and spent pulping liquor (black liquor), into a synthetic gas (syngas), which subsequently is converted into liquid fuels, power, chemicals and other high-value materials. These IFPB processes will maximize utilization of energy streams and minimize waste. **Gasification technologies are currently being commercialized, and the processes to convert to transportation fuels could come online within 5 years. The potential production volume for renewable fuels is 1.09 million barrels. Additional research in syngas fermentation would be needed to support ethanol production.**
- ***Sustainable Forest Productivity*** applies biotechnology and nanotechnology breakthroughs to sustainable forestry to manage US forest land at a high intensity to supply affordable, sustainable biomass supplies of high quality. This longer-term research focuses on developing fast-growing biomass plantations designed to produce economic, high-quality feedstocks for bio-energy and bio-products. From an energy “life-cycle” perspective, these feedstocks could be vastly superior to the current use of crops or residues. **In the short-term, IFPBs will draw from an abundant sustainable supply of forest-based biomass (estimated by USDA and DOE to be 368 million dry tons/year), which is 2.5 times current consumption. In the long term, the advanced forest management practices**

**and customized biomass cultivation enabled by this research will not only augment IFPB yield, but will also lead to healthier forests.**

The forest products industry's manufacturing facilities are an ideal foundation to develop the IFPB. Those facilities, which today produce pulp, paper and wood products, also are geared to collect and process biomass. Rather than creating a "greenfield" operation, additional bioconversion or thermochemical processes can be built around existing mills (either as extensions of the mill or as "across-the-fence" operations) to generate bio-energy or manufacture bio-products. This presents industry with dramatic potential to increase the productivity and profitability of its manufacturing infrastructure. Possible benefits include: improved efficiency of raw material utilization, protection of traditional product lines, creation of higher skilled and better paying jobs, and access to new domestic and international markets for bio-energy and bio-products.

**The choice of whether to manufacture power, fuels and/or chemicals would be driven by mill economics and location. The 8 billion gallon renewable fuel standard proposed in H.R. 3081 could provide an important market signal to drive private/public investments in RD&D need to bring IFPB technologies into full commercial use. This is especially important to our industry, as our renewable fuel production capabilities will kick in more fully after 2009.**

The IFPB uses an abundant, renewable, sustainable resource: forest material. Because forest material is carbon neutral, the bio-energy it produces helps reduce greenhouse gas emissions. Bio-energy also helps ease dependence on foreign fossil fuel by substituting for products now derived from nonrenewable carbon. By installing key IFPB technologies such as black liquor gasification, existing facilities could reduce emissions by 80-90 percent. Since forest products mills are located throughout the country, renewable bio-based fuels can be supplied more economically throughout the country. This improves both the diversity and security of the national energy supply.

Both the US national and regional economies stand to benefit from implementation of the IFPB. Global competition has led to numerous domestic mill closings as production moves overseas. These closings impact mostly rural communities. The IFPB offers an opportunity to preserve high paying, skilled jobs and revitalize manufacturing facilities in these communities – all while creating a new domestic bioindustry based on one of the world's largest sustainable biomass supplies.

**These benefits cannot be realized if forest products mills continue to move overseas. H.R. 3081 would assist the development of domestic market demand that will make it economically feasible to keep operating existing infrastructure and install IFPBs throughout the country.**

#### Working Together to Address Key Challenges

Our industry welcomes the opportunity to work with the Committee to address some key challenges to realizing our potential as an important contributor to national biofuels goals.

First, there are various definitions for renewable energy, biomass, and cellulosic fuels in federal legislation and in the federal agencies. Wood and other ligno-cellulosic materials have three primary components: cellulose, hemicellulose, and lignin. Some federal definitions exclude one or more of these key components, all of which can be converted to carbon neutral, renewable energy. At present, many companies in our industry produce energy from both cellulose (ethanol) and lignin (electric power). With IFPB technology, it will also be possible for us to directly convert hemicellulose to ethanol, and convert the lignin-based materials to a variety of bio-fuels and/or chemicals. Some of this technical capability will be transferable to the agricultural industry. **Our industry would like to work with Congress and the relevant federal agencies to construct an inclusive definition of biomass and/or renewable energy which includes the cellulose, hemicellulose, and lignin content of forest materials.**

Second, sustained and adequate funding of RD&D partnerships are essential to overcome remaining barriers to achieving IFPB technical goals. For our industry, strong and sustained partnerships with the federal government are essential for accelerating the development and adoption of the new technologies. This is particularly important for the IFPB, where adequate co-investment for RD&D can help mitigate the technical risks (especially integration with capital-intensive, legacy infrastructure) of early adopters of emerging IFPB technologies. **Our industry plans to continue to work with Congress in order to ensure adequate overall funding of the joint USDA/DOE biomass research program and to ensure inclusion of forest industry priorities for development of IFPB enabling technologies and demonstration of integrated forest-based biorefineries.**

Third, federally-funded research institutions such as the US Forest Service's Forest Products Laboratory (FPL) are home to scientific expertise and research facilities that the industry relies upon to address IFPB research goals. The FPL's capabilities have been diluted by budget difficulties that have delayed facilities construction and resulted in cuts in scientific staff. **Our industry would like to work with you to recommend programmatic restructuring within FPL, to make more effective use of its research capabilities to meet both industry technical needs and USFS mission imperatives.**

### Next Steps

Transforming forest products mills into IFPBs promises to reinvent the forest products industry and rapidly advance national goals for energy, environmental performance, and new domestic bioindustry. We look forward to working with this Committee and other Members of Congress to maximize the industry role in contributing to these goals. The forest products industry recognizes the existing opportunities to advance these goals in both H.R. 3081, as well as the ongoing Energy Bill conference process. We also realize the potential for achieving these goals within the context of the 2007 Farm Bill. As this Committee begins to work towards the reauthorization of the Farm Bill, we look forward to working with you to ensure all opportunities are realized.